Rochester Electronics

Datasheet

Rochester Electronics Manufactured Components

Rochester branded components are manufactured using either die/wafers purchased from the original suppliers or Rochester wafers recreated from the original IP. All recreations are done with the approval of the OCM.

Parts are tested using original factory test programs or Rochester developed test solutions to guarantee product meets or exceed the OCM data sheet.

Quality Overview

- ISO-9001
- AS9120 certification
- Qualified Manufacturers List (QML) MIL-PRF-35835
    - Class Q Military
    - Class V Space Level
- Qualified Suppliers List of Distributors (QSLD)

- Rochester is a critical supplier to DLA and meets all industry and DLA standards.

Rochester Electronics, LLC is committed to supplying products that satisfy customer expectations for quality and are equal to those originally supplied by industry manufacturers.

The original manufacturer's datasheet accompanying this document reflects the performance and specifications of the Rochester manufactured version of this device. Rochester Electronics guarantees the performance of its semiconductor products to the original OEM specifications. 'Typical' values are for reference purposes only. Certain minimum or maximum ratings may be based on product characterization, design, simulation, or sample testing.

DECEMBER 1972 REVISED DECEMBER 1983

description

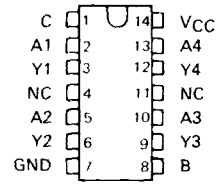
Operation of these monolithic 4-bit true/complement elements is controlled by the B and C inputs. With the B input low, the 4-bit binary input (A) is transferred to the output (Y) in either complementary form (with C low) or true form (with C high). When the B input is high, the output will be at the complementary level of the C input regardless of the levels of the data inputs.

These circuits are fully compatible for use with other TTL circuits. Input clamping diodes are provided to minimize transmission line effects and thereby simplify system design. Each input represents only one normalized series 54H/74H load, and full fan-out to 10 series 54H/74H loads is available from each of the outputs in the low-level condition.

Power dissipation is 270 mW typically with an average propagation delay of 14 ns from data inputs to output.

The SN54H87 is characterized for operation over the full military temperature range of −55°C to 125°C, and the SN74H87 is characterized for operation from 0°C to 70°C.

SN54H87 . . . J OR W PACKAGE
SN74H87 . . . J OR N PACKAGE
(TOP VIEW)



NC No internal connection

FUNCTION TABLE

CONTROL INPUTS		OUTPUTS			
B	C	Y1	Y2	Y3	Y4
L	L	$\overline{A1}$	$\overline{A2}$	$\overline{A3}$	$\overline{A4}$
L	H	A1	A2	A3	A4
H	L	H	H	H	H
H	H	L	L	L	L

H high level, L low level
A1, A2, A3, A4 the level of the respective A input.

absolute maximum ratings over operating free-air temperature range (unless otherwise noted)

Supply voltage, V_{CC} (see Note 1) . . . . . 7 V
Input voltage . . . . . 5.5 V
Operating free-air temperature range: SN54H87 Circuits . . . . . −55°C to 125°C
SN74H87 Circuits . . . . . 0°C to 70°C
Storage temperature range . . . . . −65°C to 150°C

NOTE 1: Voltage values are with respect to network ground terminal.

recommended operating conditions

	SN54H87			SN74H87			UNIT
	MIN	NOM	MAX	MIN	NOM	MAX	
Supply voltage, V_{CC}	4.5	5	5.5	4.75	5	5.25	V
High-level output current, I_{OH}			1			1	mA
Low-level output current, I_{OL}			20			20	mA
Operating free-air temperature, T_A	55		125	0		70	C

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electrical characteristics over recommended operating free-air temperature range (unless otherwise noted)

PARAMETER		TEST CONDITIONS†		MIN	TYP‡	MAX	UNIT
V_{IH}	High-level input voltage			2			V
V_{IL}	Low-level input voltage					0.8	V
V_{IK}	Input clamp voltage	V_{CC} = MIN, I_I = −8 mA				−1.5	V
V_{OH}	High-level output voltage	V_{CC} = MIN, V_{IH} = 2 V, V_{IL} = 0.8 V, I_{OH} = −1 mA		2.4	3.5		V
V_{OL}	Low-level output voltage	V_{CC} = MIN, V_{IH} = 2 V, V_{IL} = 0.8 V, I_{OL} = 20 mA			0.2	0.4	V
I_I	Input current at maximum input voltage	V_{CC} = MAX, V_I = 5.5 V				1	mA
I_{IH}	High-level input current	V_{CC} = MAX, V_I = 2.4 V				50	μA
I_{IL}	Low-level input current	V_{CC} = MAX, V_I = 0.4 V				−2	mA
I_{OS}	Short-circuit output current§	V_{CC} = MAX		−40		−100	mA
I_{CC}	Supply current	V_{CC} = MAX, See Note 2	SN54H87		54	78	mA
			SN74H87		54	89	

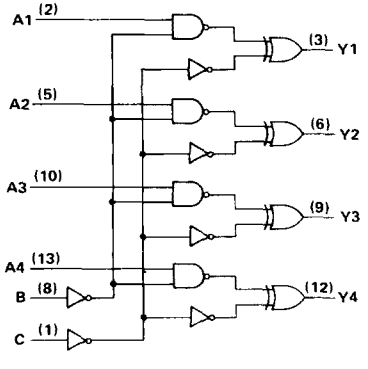
†For conditions shown as MIN or MAX, use the appropriate value specified under recommended operating conditions for the applicable type.
‡All typical values are at V_{CC} = 5 V, T_A = 25°C.
§Not more than one output should be shorted at a time and duration of the short-circuit should not exceed 1 second.
NOTE 2: I_{CC} is measured for the following conditions:
a. All A inputs are at 4.5 V, B and C inputs are grounded, and all outputs are open.
b. B and C inputs are at 4.5 V, all A inputs are grounded, and all outputs are open.

switching characteristics, V_{CC} = 5 V, T_A = 25°C

PARAMETER		TEST CONDITIONS	MIN	TYP	MAX	MAX
t_{PLH}	Propagation delay time, low-to-high-level output from any A input	C_L = 25 pF, R_L = 280 Ω, See Note 3		14	20	ns
t_{PHL}	Propagation delay time, high-to-low-level output from any A input			13	19	ns
t_{PLH}	Propagation delay time, low-to-high-level output from B or C inputs			17	25	ns
t_{PHL}	Propagation delay time, high-to-low-level output from B or C inputs			17	25	ns

NOTE 3: See General Information Section for load circuits and voltage waveforms.

logic diagram



Pin numbers shown on logic notation are for J or N packages.

schematics of inputs and outputs